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ARIZONA STATE UNIVERSITY ■ COLLEGE OF BUSINESS
CENTER FOR BUSINESS RESEARCH

*Population Estimates and Projections*

# Slow Growth Next Few Years, Then More Rapid

Arizona's population growth, already subpar for nearly two years as of the end of 1988, likely will remain below average for another three to four years. The longer-term outlook, however, remains quite favorable for further growth; the current period of slow growth represents the low phase of a cycle.

The Center for Business Research (CBR) has produced quarterly population estimates since 1985. Now, after a thorough review of methodology, a revised series has been produced, but differences from the original series are quite small. Except for near-term changes (to 1990), the CBR's population projections differ little from those presented in the May 1988 issue of *Arizona Business*. (Most of the text in that article remains relevant and has not been repeated here.)

## POPULATION ESTIMATES

The CBR estimates are derived from housing data — change in occupied housing units and first-time electrical connections — in Maricopa County. They are tied to the 1970 and 1980 censuses and are controlled to the 1985 special census as well. Annually, they are compared to estimates produced by very different methods by the U.S. Bureau of the Census. The CBR mid-year 1987 estimate is 9,000 higher than that of the Census Bureau.

The CBR's estimating technique proved to be accurate for Maricopa County — the 1985 special census was missed by only 3,000 people — but its future accuracy is dependent on consistent accuracy of census counts. Should the 1990 census reduce the undercount believed to have occurred in earlier censuses through the use of new techniques (some being tested locally), the CBR estimates in 1990 may fall short of the counted number of residents.

Based on Maricopa County data and statewide employment figures, the CBR estimates total Arizona population each quarter, but the figures are not as accurate as those for the Phoenix area. Annually, the CBR estimates population for all 15 counties. In the review process just completed, the CBR estimates of the population of Pima County and non-urban Arizona were raised by approximately 15,000 persons as of mid-year 1987, in part because of the population estimates produced by the Arizona Department of Economic Security. Compared to the Census Bureau estimates, the CBR figures for Arizona are 35,000 higher at mid-year 1987; 22,000 of the difference is in Pima County. The Census Bureau ties its estimates to the 1985 special census in Pima

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County, which almost certainly undercounted the population.

The original and revised quarterly estimates for Maricopa County since the 1985 special census are shown in Table 1. The maximum difference in population change in any quarter is 2,000, frequently offset in the following quarter. The net effect is that the third quarter 1988 population estimate is only 1,000 higher than previously reported.

The short time period examined in Table 1 illustrates the extreme cyclicality of Phoenix area economic and population growth. This is even more obvious in the annual data shown in Table 2. Despite record net in-migration to the Phoenix area in the mid-1980s, the average of the 1980s is about the same as for the 1970s. Net migration in the rest of the state has been weaker in the 1980s.

## EMPLOYMENT LEADS MIGRATION

The primary explanation for short-term fluctuations in net migration is the cyclicality of job availability. Employment changes lead variations in net migration by a substantial time period both in Maricopa County and in the state as a whole.

Based on quarterly data since 1970, changes in wage and salary employment two quarters earlier are highly correlated with net migration. The highest correlation, however, is with construction employment, which has the longest lead time of any sector at roughly four quarters. The relationship between FIRE (finance, insurance, and real estate) and net migration also is strong, but with a lead time of only one quarter. Using annual data, the correlation between changes in construction employment and net migration is even stronger, with employment leading by one year. These relationships allow reasonably accurate projections of net migration to be made up to one year in the future, based on changes in employment that have already occurred.

The relationship between employment changes and net migration is strongest in Maricopa County. Because the Phoenix area accounts for two-thirds of the state's economic activity, the leading relationship holds for state totals as well. In Pima County and rural Arizona, however, all correlations between employment changes and net migration are too weak to draw any conclusions.

**TABLE 1**
**QUARTERLY POPULATION ESTIMATES IN THOUSANDS**
**MARICOPA COUNTY**

| | | | Net Migration | |
|---|---|---|---|---|
| *Quarter/Year* | *Population* | *Change* | *Revised* | *Original* |
| 3/85 | 1,838* | 22 | 17 | 19 |
| 4/85 | 1,858 | 20 | 15 | 16 |
| 1/86 | 1,880 | 22 | 17 | 18 |
| 2/86 | 1,901 | 21 | 16 | 15 |
| 3/86 | 1,920 | 19 | 14 | 14 |
| 4/86 | 1,940 | 20 | 14 | 14 |
| 1/87 | 1,956 | 16 | 10 | 12 |
| 2/87 | 1,969 | 13 | 8 | 6 |
| 3/87 | 1,983 | 14 | 8 | 8 |
| 4/87 | 1,994 | 11 | 6 | 5 |
| 1/88 | 2,007 | 13 | 7 | 7 |
| 2/88 | 2,015 | 8 | 3 | 1 |
| 3/88 | 2,025 | 10 | 4 | 5 |

*Special census count

*Source:* Center for Business Research, College of Business, Arizona State University.

**TABLE 2**
**POPULATION CHANGE**
**(In Thousands)**

| *Fiscal* | Total Change | | | | Net Migration | | | |
|---|---|---|---|---|---|---|---|---|
| *Year* | *Arizona* | *Maricopa* | *Pima* | *Non-urban* | *Arizona* | *Maricopa* | *Pima* | *Non-urban* |
| 1981 ... | 81 | 51 | 12 | 18 | 52 | 36 | 7 | 9 |
| 1982 ... | 73 | 44 | 14 | 15 | 43 | 28 | 9 | 6 |
| 1983 ... | 72 | 43 | 13 | 16 | 42 | 27 | 8 | 7 |
| 1984 ... | 104 | 70 | 16 | 18 | 73 | 53 | 11 | 9 |
| 1985 ... | 123 | 86 | 18 | 19 | 90 | 67 | 13 | 10 |
| 1986 ... | 126 | 85 | 18 | 23 | 92 | 65 | 13 | 14 |
| 1987 ... | 103 | 68 | 15 | 20 | 67 | 46 | 9 | 12 |
| 1988 ... | 78 | 46 | 13 | 19 | 42 | 24 | 7 | 11 |
| | | | | AVERAGES | | | | |
| 1961-70 | 47 | 30 | 9 | 8 | 24 | 19 | 5 | 0 |
| 1971-80 | 94 | 54 | 18 | 22 | 70 | 42 | 14 | 14 |
| 1981-88 | 95 | 62 | 15 | 18 | 63 | 43 | 10 | 10 |

*Source:* Center for Business Research, College of Business, Arizona State University (1981 - date) and U.S. Bureau of the Census (1961-80).

## SHORT-TERM OUTLOOK

Employment gains through much of 1988 were quite weak across the state. Construction employment continued to decline, though not quite as rapidly as in 1987. Thus, net in-migration should remain slow through most of calendar year 1989. Gradual improvement is foreseen, however, from the very weak net inflows of the second and third quarters of 1988. Net in-migration during those quarters was the least since the mid-1960s, except for a few quarters in 1975-76.

Despite the modest improvement that is presumed in early 1989, net in-migration during 1988-89 is likely to be less than in 1987-88 (see Table 3). Assuming national economic conditions do not deteriorate too much prior to mid-1990, population gains in 1989-90 should be higher, but still well below average. The improvement probably will be greatest in the Phoenix area. Pima County likely will continue to be troubled by its manufacturing sector. Rural Arizona, not as much affected by the construction slump, did not decline as much from 1986 to 1988, thus is not likely to show much improvement in 1989-90.

Alternate scenarios are not presented for the next one and one-half years because flows are not likely to be substantially different from those shown in Table 3. With significant problems in several industries — e.g. construction, finance, real estate, health services — a set of events that would lead to higher net in-migration in the near-term is diffi-

cult to envision. In contrast, net inflows in 1989-90 could be somewhat weaker than shown if deterioration in the national economy occurs, accompanied by rising interest rates, or if economic conditions in Arizona continue to worsen at a greater rate than anticipated.

## LONG-TERM OUTLOOK

The long-term outlook (see Table 4) is not much different from that presented last year. The population change projected between 1990 and 2010 in the "middle" scenario is about the same. The slightly lower projected population reflects the weakness likely during the next couple of years. On a yearly basis, assuming a national recession sometime around the end of 1990, population gains are projected to remain weak through fiscal year 1992. However, a strong expansion is expected to ensue thereafter.

Lesser population gains are projected in the "low" scenario, especially between 2000 and 2010. This scenario corresponds at the state level to the projections issued in 1988 by the U.S. Bureau of the Census. Given the sophistication and interstate interactions of their model, the possibility of slower growth should not be dismissed. Both net natural increase and net migration are lower in this alternative, largely due to the aging of the baby-boom generation.

The "high" scenario is nearly the same as presented last year. It projects population gains roughly equal to those in the "high 2" alternative, the state's "official" projections from 1986, except during the 1990s in Maricopa County. The latter is viewed by the CBR as being unrealistic. A new set of projections currently are underway at the Arizona Department of Economic Security and are expected to reflect much less growth than previously projected.

## CALIFORNIA MIGRATION

In an attempt to provide a rationale for the very high inflows projected in the "official" series, the idea of an increased flow of migrants from California to Arizona has been advanced by proponents of faster growth. A review of historical data and current information from California, however, does not provide much support for this theory. Arizona has received a relatively steady net inflow from California for many years. Further, California's problems, which would prompt a future outflow, are not new.

During the 1970s, California experienced substantial out-migration — similar to that theorized for the future — to the extent that its net flow was negative in some years. Net out-migration occurred to states throughout the West. The net flow to Arizona was less than that to Oregon, Washington, Nevada, Texas, Idaho and Utah — only 6 percent of the net outflow to all of the western states. When each of these western states experienced economic problems in the early- to mid-1980s, the outflow from California slowed sharply. While the other western states were slumping, the Arizona economy was booming, but the net flow from California to Arizona did not change. When opportunities elsewhere were limited, Californians chose to stay in-state rather than move to Arizona.

Current information from California does not provide much indication that conditions will be different

**TABLE 3**
**LATEST POPULATION ESTIMATES AND SHORT-TERM POPULATION PROJECTIONS**
**(In Thousands)**

| Fiscal Year | Arizona | Maricopa | Pima | Non-urban | Arizona | Maricopa | Pima | Non-urban |
|---|---|---|---|---|---|---|---|---|
| | | Total Population | | | | Change | | |
| 1988 ... | 3,497 | 2,015 | 654 | 828 | 78 | 46 | 13 | 19 |
| 1989 ... | 3,570 | 2,060 | 684 | 846 | 73 | 45 | 10 | 18 |
| 1990 ... | 3,655 | 2,115 | 675 | 865 | 85 | 55 | 11 | 19 |
| | | Net Natural Increase | | | | Net Migration | | |
| 1988 ... | 37 | 22 | 6 | 9 | 42 | 24 | 7 | 11 |
| 1989 ... | 37 | 23 | 5 | 9 | 36 | 22 | 5 | 9 |
| 1990 ... | 38 | 24 | 5 | 9 | 47 | 31 | 6 | 10 |

*Source:* Center for Business Research, College of Business, Arizona State University.

**TABLE 4**
**POPULATION PROJECTIONS BY DECADE, FOUR SCENARIOS**
**(In Thousands)**

| | 1980 | 1990 | 2000 | | | | 2010 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Census* | *Projection* | *Low* | *Middle* | *High* | *High2* | *Low* | *Middle* | *High* | *High2* |
| **Total Population** | | | | | | | | | | |
| Maricopa Co. | 1,509 | 2,115 | 2,700 | 2,815 | 2,880 | 3,250 | 3,170 | 3,570 | 3,705 | 4,050 |
| Pima Co. | 531 | 675 | 795 | 825 | 900 | 975 | 900 | 1,000 | 1,150 | 1,260 |
| Non-urban Ariz. | 677 | 865 | 1,025 | 1,070 | 1,120 | 1,095 | 1,150 | 1,285 | 1,415 | 1,360 |
| Arizona | 2,717 | 3,655 | 4,520 | 4,710 | 4,900 | 5,320 | 5,220 | 5,855 | 6,270 | 6,670 |
| **Ten-Year Population Change** | | | | | | | | | | |
| Maricopa Co. | 538 | 606 | 585 | 700 | 765 | 990 | 470 | 755 | 825 | 800 |
| Pima Co. | 180 | 144 | 125 | 150 | 230 | 240 | 105 | 175 | 250 | 285 |
| Non-urban Ariz. | 223 | 188 | 155 | 205 | 250 | 210 | 125 | 215 | 295 | 265 |
| Arizona | 941 | 938 | 865 | 1,055 | 1,245 | 1,440 | 700 | 1,145 | 1,370 | 1,350 |

*Source:* Center for Business Research, College of Business, Arizona State University. 1980 Census data are from the U.S. Bureau of the Census. The 'High2' scenario is the latest (1986) population projections from the Arizona Department of Economic Security.

in the future. In the last year, many firms — especially in the aerospace industry — invested in the Los Angeles area by taking out building permits for new production facilities. Many of those firms considering a move out of the Los Angeles area are looking at the California desert east of L.A., which offers reduced costs, less congestion, less pollution, and closer access to L.A.

While some increased outflow from California is likely to occur in coming years, all of the West will be competing for those firms and people. Californians have shown a clear preference for certain states — Arizona not among them. The idea that Arizona will greatly benefit from this phenomenon represents a hope rather than a likelihood, and thus belongs in an optimistic scenario, not in the only projection series offered. To achieve the flows projected in the "high 2" scenario, some 400,000 *additional* people would have to migrate to Arizona in the 1990s beyond the roughly 650,000 projected by the CBR. This represents a huge increase over the 600,000 to 700,000 received both in the 1970s and 1980s.

– Tom R. Rex
*Research Manager*

**Population Growth and Housing**

In the January 1988 issue of *Arizona Business*, ties between the construction industry, the overall economy and population growth were analyzed. For the Phoenix area, it included projections of population growth and housing indicators such as absorption, vacancies and starts. At the time it was written, it was one of the first published reports of the severity of the area's disequilibriums and the likelihood of significantly subpar growth for several years. It was viewed in some circles as pessimistic, yet a current review of its accuracy shows that where it erred, it missed by being too optimistic.

Population growth was projected to be 62,000 in the 1987-88 fiscal year; it now is estimated to have been 46,000. New housing units authorized were projected to be 26,000; they totalled 22,200 instead. Vacancy rates of apartments were projected to peak in winter 1987-88, which they did, but instead of lowering modestly they have remained constant at this high level.

Further, vacancy rates on housing units other than apartments increased during 1988. More than 55,000 units, 7 percent of all housing, were vacant in third quarter 1988. Even if an average of only 20,000 units per year are built from 1989 to 1992, the overall housing vacancy rate will not attain historically average levels of approximately 3 percent by the end of 1992, if population growth is similar to that projected in the accompanying article. With similar situations present in commercial real estate, a strong construction upturn is highly unlikely before 1992 and may not occur until 1993.

**Complete Report Available**

This article summarizes a longer report "Population Estimates and Projections," which discusses historical population growth, the CBR's estimates between 1980 and 1988, and population projections, both near-term and long-term. It includes numerous tables of data and a discussion of methodology used to estimate and project population. Copies of the report are available from the Center for Business Research, College of Business, Arizona State University, Tempe, Arizona 85287; (602) 965-3961.

## Valley Inflation Jumps in Fourth Quarter

The seasonally adjusted inflation rate in the Phoenix metropolitan area surged to 2.0 percent in fourth quarter 1988 from the approximately 1 percent per quarter rate of the previous several quarters. Except during first quarter 1987, when soaring gasoline prices were almost solely responsible for a sharp advance, the overall inflation rate has not risen as much in a single quarter since 1981.

Before seasonal adjustment, the Metropolitan Phoenix Consumer Price Index climbed 1.3 percent to 122.5 (1982-84 = 100). The annual advance of 5.0 percent, while higher than in the three previous quarters, was not much different from the 4.7 percent rate recorded in fourth quarter 1987.

### COMPONENT INDEXES

Unexpectedly higher inflation was widespread across the CPI's major categories, but generally can be traced to just a couple of subcategories in each case. As seen in Table 1, each major category except apparel and upkeep registered a greater advance than in the third quarter; increases were particularly large in transportation, medical care, and entertainment. In general, the third quarter's inflation rate was held down by a large number of sales; relatively few sales occurred in the fourth quarter.

**Food and Beverages**

During the last three quarters of 1988, food and beverage price increases were greater than they had been in several years, an expected result of the summer drought. In the fourth quarter, food at home prices rose 2.2 percent, about as anticipated, but prices of food away from home and alcoholic beverages hardly changed.

Within the grocery subcategory, prices of cereal and bakery products declined, partially offsetting a large gain in the third quarter. Prices of dairy products dipped for the third time in four quarters. But fruit and vegetable prices soared. Fresh fruit prices were up 7 percent in fourth quarter 1988, 59 percent over fourth quarter 1987. Fresh vegetable prices rose 27 percent in the quarter and 39 percent in the year.

**Housing**

Shelter costs again barely climbed (see Table 2). Renters' costs dropped for the third straight quarter and the seventh time in the last nine quarters. Homeowners' costs again rose modestly.

In contrast, costs of household furnishings and operations advanced by the most in several years. A lack of seasonal sales of furniture and bedding was the single greatest factor. A large increase in fuel and other utility costs is traceable almost entirely to a huge boost in the cable TV category, which ex-

perienced both a return from sale prices and price hikes in the same quarter.

### Transportation

Transportation costs rose the most since the gasoline-induced gains of early 1987. Two subcategories were responsible for most of the acceleration. Auto insurance premiums were boosted 10 percent, on the heels of a 5 percent advance in the third quarter. Public transportation costs jumped 10 percent as well, mostly due to airline fares returning to earlier levels.

A big gain in prices of auto parts followed declines in earlier quarters. Gasoline prices dropped 1 percent while auto prices rose moderately.

### Medical Care

After a period of price stability in late 1987 and early 1988, increases in medical care costs again exceeded the overall inflation rate. Hospital cost increases continued to account for much of the category's gain, though the index for professional services also rose by a relatively large amount in the fourth quarter.

### Other Categories

Entertainment costs surged, with big gains for toys and hobbies and for entertainment services. While apparel cost increases moderated, prices were 10 percent higher than at the end of 1987. The index for other goods and services climbed modestly.

## COMPARISON AREAS

Before seasonal adjustment, inflation in the Phoenix area was slightly higher than the national average, with mixed results by category (see Table 3). During the calendar year, inflation in the Phoenix area was higher, due primarily to larger gains in the transportation and apparel and upkeep categories.

## OUTLOOK

The fourth quarter's inflation rate probably was an aberration. Quarterly rates are expected to be in the 1.0 to 1.5 percent range in 1989. This would result in a year-end rate comparable to 1988's 5.0 percent, but higher year-over-year rates would be measured early in 1989. Next month's year-end wrap-up issue will examine 1988-89 inflation in more detail.

– Tom R. Rex
*Research Manager*

**TABLE 1**
**PERCENT CHANGES IN**
**METROPOLITAN PHOENIX CONSUMER PRICE INDEX**

| | | Seasonally Adjusted from Preceding Quarter | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| *Expenditure Category* | *Relative Importance* | *1st 1987* | *2nd 1987* | *3rd 1987* | *4th 1987* | *1st 1988* | *2nd 1988* | *3rd 1988* | *4th 1988* |
| ALL ITEMS | 100.0 | 2.1 | 1.1 | 0.7 | 0.9 | 0.8 | 1.3 | 0.9 | 2.0 |
| Food and Beverages | 16.4 | –0.2 | 0.5 | 0.9 | 0.6 | 0.9 | 2.0 | 1.3 | 1.4 |
| Housing | 42.4 | 0.5 | 0.2 | 0.5 | 2.3 | 1.0 | 0.2 | 0.4 | 1.7 |
| Apparel and Upkeep | 5.8 | –2.5 | 2.8 | 2.7 | 0.9 | 2.3 | 2.9 | 3.6 | 1.5 |
| Transportation | 19.1 | 8.1 | 3.0 | 0.9 | -2.0 | –0.5 | 2.4 | 1.0 | 3.1 |
| Medical Care | 6.7 | 1.8 | 2.7 | –2.1 | 0.9 | 0.3 | 3.3 | 0.4 | 2.8 |
| Entertainment | 4.6 | 2.4 | –1.2 | 2.0 | 3.1 | 1.2 | 0.1 | 1.2 | 3.6 |
| Other Goods and Services | 5.0 | 2.0 | 0.3 | 2.9 | 0.6 | 2.2 | 0.9 | 0.8 | 1.1 |

**TABLE 2**
**METROPOLITAN PHOENIX CONSUMER PRICE INDEX**
**Fourth Quarter 1988**

| | Index (1982-84 = 100) | | Percent Change from | |
|---|---|---|---|---|
| *Expenditure Category* | *Last Quarter* | *This Quarter* | *Last Quarter** | *Year-Ago Quarter* |
| ALL ITEMS | 120.9 | 122.5 | 2.0 | 5.0 |
| Food and Beverages | 120.4 | 121.7 | 1.4 | 5.8 |
| Food | 119.3 | 120.6 | 1.4 | 5.2 |
| Food at Home | 121.1 | 123.4 | 2.2 | 7.9 |
| Cereal and Bakery Products | 138.3 | 133.2 | –3.6 | 5.0 |
| Meats, Poultry, Fish, and Eggs | 114.6 | 116.5 | 1.6 | 6.6 |
| Dairy Products | 112.0 | 111.3 | –0.1 | –1.0 |
| Fruits and Vegetables | 145.7 | 158.2 | 10.1 | 34.4 |
| Other Food at Home | 112.4 | 115.8 | 2.7 | 3.4 |
| Food Away from Home | 117.4 | 117.6 | 0.4 | 2.3 |
| Housing | 116.9 | 117.0 | 1.7 | 3.5 |
| Shelter | 115.6 | 115.6 | 0.2 | 1.0 |
| Renters' Costs** | 118.7 | 116.9 | –1.1 | –1.8 |
| Homeowners' Costs** | 118.3 | 119.1 | 0.7 | 2.4 |
| Fuel and Other Utilities | 122.7 | 121.2 | 4.8 | 7.7 |
| Gas (piped) and Electricity | 125.9 | 115.3 | 2.3 | 4.3 |
| Household Furnishings/Operations | 115.6 | 116.8 | 3.4 | 6.8 |
| Apparel and Upkeep | 120.7 | 124.7 | 1.5 | 10.1 |
| Transportation | 117.2 | 120.7 | 3.1 | 6.1 |
| Private Transportation | 118.1 | 120.1 | 2.1 | 5.5 |
| New and Used Cars | 130.3 | 132.8 | 1.7 | 6.9 |
| Motor Fuels | 77.2 | 75.5 | –1.3 | –3.2 |
| Public Transportation | 107.0 | 118.8 | 10.4 | 8.4 |
| Medical Care | 147.0 | 150.8 | 2.8 | 6.8 |
| Entertainment | 139.7 | 144.9 | 3.6 | 6.1 |
| Other Goods and Services | 133.4 | 134.3 | 1.1 | 5.3 |

*Seasonally adjusted
**Base period is second quarter 1983.

**TABLE 3**
**METROPOLITAN PHOENIX AND UNITED STATES**
**CONSUMER PRICE INDEXES**
**Fourth Quarter 1988**

| | Percent Change from Last Quarter* | | Percent Change from One Year Ago | |
|---|---|---|---|---|
| *Expenditure Category* | *Phoenix* | *United States* | *Phoenix* | *United States* |
| ALL ITEMS | 1.3 | 1.1 | 5.0 | 4.2 |
| Food and Beverages | 1.1 | 0.7 | 5.8 | 5.2 |
| Housing | 0.1 | 0.3 | 3.5 | 3.8 |
| Apparel and Upkeep | 3.3 | 6.5 | 10.1 | 3.9 |
| Transportation | 3.0 | 1.0 | 6.1 | 2.7 |
| Medical Care | 2.6 | 1.4 | 6.8 | 6.8 |
| Entertainment | 3.7 | 1.2 | 6.1 | 4.2 |
| Other Goods and Services | 0.7 | 2.5 | -5.3 | 7.0 |

*Not seasonally adjusted

*Source (Tables 1-3):* Metropolitan Phoenix data compiled by the Center for Business Research, College of Business, Arizona State University, in co-sponsorship with Valley National Bank; other data are from the U.S. Department of Labor, Bureau of Labor Statistics.

## Metro Phoenix Economy Declined Again in October

The coincident economic index for the Phoenix area fell for the fifth consecutive month in October, though the 0.3 percent decrease was not as large as the 0.9 percent drop in September. The index was 145.9 (1982 = 100) in October, 1.6 percent below its May peak.

In contrast, the coincident indexes for the Tucson area and for rural Arizona increased for the third straight month in October. Pima County's small 0.2 percent gain, comparable to those of the two prior months, placed its index at 137.6. The index for non-urban Arizona, however, advanced a relatively strong 0.6 percent, up from the modest gains of the two prior months, reaching 129.2. The composite statewide measure dipped 0.1 percent to 141.7.

The economic slowdown had its greatest effect on most of the state between April and July. But in Maricopa County, the worst effects did not occur until September and October. In the seven months after March, the Tucson area economy declined the least in the state. It showed more employment growth, and a smaller increase in its unemployment rate than the other areas. In Maricopa County, each of the four components declined on net during those seven months.

In October, economic performance varied widely across the state. The employment situation (growth in wage and salary employment and change in the unemployment rate) deteriorated significantly in Maricopa County, but was reasonably strong in rural Arizona. The value of commercial building permits rose in the Phoenix area, but declined elsewhere. Retail sales increased slightly throughout the state.

A preliminary look at November data suggests that the state's economy performed better. The unemployment rate fell throughout the state and employment rose in rural Arizona. For the first time since March, all three areas probably posted monthly gains. Annual growth rates should also start to improve, after dropping to approximately 1 percent through October.

**– Tom R. Rex**
*Research Manager*

## Purchasing Indicators Flat in December

The Arizona economy was "on hold" in December, as growth in new orders stopped and net declines were registered both in employment and in purchased materials inventory levels. Prices continued to increase, but at a slower pace than in the earlier part of the year.

Yet there are encouraging signs: the inflation rate is moderating somewhat, production still is positive, vendor backlogs appear to be holding, and inventories are well under control.

### CAPITAL EXPENDITURE PLANS

The special question, asked each December, covers *anticipated expenditures* for new plant and equipment during 1989. For the first time since December 1982, the answers indicate that a contraction in capital expenditures is anticipated. While the new decrease was small, it shows that Arizona firms view 1989 with caution and do not expect to add to capacity. Thus, capital expenditures probably will not be a factor stimulating overall economic growth.

**– Harold Fearon**

*Dr. Fearon is the National Association of Purchasing Management Professor in the ASU College of Business.*

**TABLE 1**
**DECEMBER PURCHASING SURVEY**

| | Percent of Purchasing Managers Indicating Each Response (December compared to November) | | |
|---|---|---|---|
| *Key Indicators* | *Higher* | *Same* | *Lower* |
| Prices paid for major commodities | 42 | 56 | 2 |
| Delivery time from vendors | 36 | 58 | 6 |
| Purchased materials inventory level | 21 | 43 | 36 |
| New orders received | 32 | 36 | 32 |
| Production | 28 | 48 | 24 |
| Employment | 12 | 69 | 19 |
| Purchases | 35 | 37 | 28 |

**TABLE 2**
**ANTICIPATED EXPENDITURES FOR NEW PLANT AND EQUIPMENT**

| | Percent of Purchasing Managers Indicating Each Response | | |
|---|---|---|---|
| | *Higher* | *Same* | *Lower* |
| 1989 compared to 1988 | 31 | 31 | 38 |
| 1988 compared to 1987 | 42 | 28 | 30 |
| 1987 compared to 1986 | 53 | 34 | 13 |
| 1986 compared to 1985 | 48 | 33 | 19 |
| 1985 compared to 1984 | 53 | 28 | 19 |
| 1984 compared to 1983 | 53 | 31 | 16 |
| 1983 compared to 1982 | 27 | 26 | 47 |
| 1982 compared to 1981 | 40 | 19 | 41 |

*Source (Tables 1 and 2):* Purchasing Management Association of Arizona, Purchasing Management Association of Southern Arizona, and the Northern Arizona Group.

# Arizona Leading Index Moves Up in November

The Arizona Index of Leading Economic Indicators rose in November to 110.7. The November figure was 0.5 percent higher than the revised 110.2 figure recorded in October, but was 0.4 percent below the 111.1 figure for November 1987 (1977 = 100).

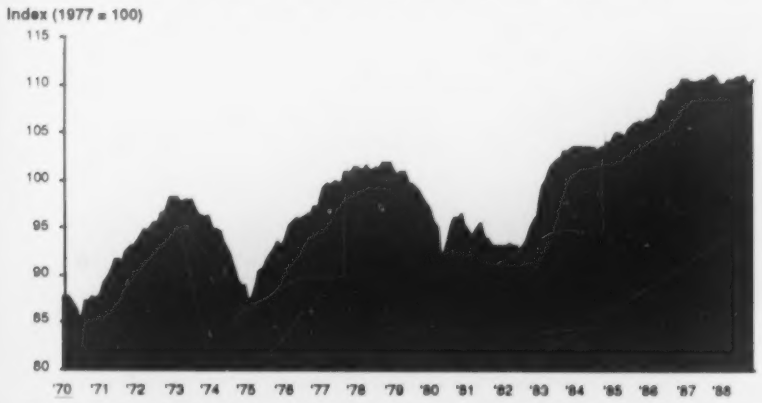
Providing the biggest boost to the index was an increase in seasonally adjusted residential building permits. Manufacturing hours worked, the money supply, delivery times, and employment were also positive influences. Inventories, new orders, production, and sensitive materials prices had a negative impact. Unemployment insurance claims were unavailable.

## ANALYSIS

The path of the Arizona Index of Leading Indicators from 1970 to the present is illustrated in Figure 1. The graph clearly shows the length and strength of the current expansion compared to those which occurred earlier. The index started rising in 1982 when the last recession was about to end and continued its upward course until the early part of 1987. The prior expansions of the early and mid-seventies are also evident in the graph.

The earlier business cycles show a pattern of rapid increase followed by a period of very slow growth which finally drops into recession. The current expansion has moved through the period of rapid increase into the part of the cycle characterized by slow growth. The general Arizona economy would seem to be in the midst of a normal business cycle rather than the "melt down" suggested in the national press. The problems in Arizona's construction industry have had an impact on the rest of the state's economy, but we do appear to be weathering the storm.

FIGURE I
ARIZONA INDEX OF LEADING ECONOMIC INDICATORS




*Source:* Economic Outlook Center, College of Business, Arizona State University; sponsored by Citibank (Arizona).

TABLE 1
NET CONTRIBUTION OF INDIVIDUAL COMPONENTS TO THE ARIZONA INDEX OF LEADING ECONOMIC INDICATORS

| | Net Contribution* | | | |
|---|---|---|---|---|
| | *Aug.* | *Sept.* | *Oct.* | *Nov.* |
| Delivery Time* | .02 | –.08 | –.03 | .01 |
| Inventory Levels* | –.06 | –.06 | .14 | –.12 |
| New Orders* | –.02 | –.08 | .06 | –.03 |
| Production* | –.06 | .01 | .02 | –.01 |
| Employment* | .05 | –.03 | –.10 | .01 |
| Residential Building Permits | .31 | –.24 | –.20 | .38 |
| Unemployment Insurance Claims | .00 | .00 | .00 | .00 |
| Average Workweek, Manufacturing | .05 | .00 | –.07 | .12 |
| Money Supply | –.10 | –.11 | –.13 | .10 |
| Change in Sensitive Materials Prices | .01 | –.07 | –.08 | –.02 |
| OVERALL INDEX CHANGE (%) | .20 | –.67 | –.40 | .45 |

*The net contribution of each component is calculated by multiplying the monthly percent change in its index by its relative importance.

*Based on indicators from the purchasing management associations of Arizona and southern Arizona.

*Source:* Economic Outlook Center, College of Business, Arizona State University; sponsored by Citibank (Arizona).

## OUTLOOK

The index suggests that the current slow pace of the Arizona economy will continue for at least the first half of 1989. Further, the pattern of slow growth could continue for some time longer, provided the national economy remains healthy.

– **Tracy L. Clark,** *Economist*
*Economic Outlook Center*

**The Arizona leading index is based on 10 economic indicators, combined and weighted to project the pace of economic activity several months ahead. Five of the components come from a monthly survey of Arizona purchasing managers conducted by Dr. Harold Fearon. The Arizona Index of Leading Economic Indicators is sponsored by Citibank (Arizona).**

## ARIZONA ECONOMIC INDICATORS

| | Month or Quarter | Value | Percent Change from Previous Period | Percent Change from Year Ago | Year-to-Date Value | Year-to-Date Percent Change from Year Ago |
|---|---|---|---|---|---|---|
| GROSS STATE PRODUCT (In Billions of Dollars, at Annual Rate) | | | | | | |
| Arizona - Current Dollars | 2nd Qtr. | 59.221 | 2.4 | 6.0 | NA | NA |
| Arizona - 1982 Dollars | 2nd Qtr. | 47.827 | 1.9 | 2.1 | NA | NA |
| COINCIDENT ECONOMIC INDEXES (1982 = 100) | | | | | | |
| Arizona | Oct. | 141.7 | -0.1 | 1.0 | NA | NA |
| Metropolitan Phoenix | Oct. | 145.9 | -0.3 | 0.7 | NA | NA |
| Metropolitan Tucson | Oct. | 137.6 | 0.2 | 1.8 | NA | NA |
| Non-urban Arizona | Oct. | 129.2 | 0.6 | 1.3 | NA | NA |
| CONSUMER PRICE INDEX (1982-84 = 100) | | | | | | |
| Metropolitan Phoenix | 4th Qtr. | 122.5 | 1.3 | 5.0 | NA | NA |
| INDEX OF LEADING ECONOMIC INDICATORS (1977 = 100) | | | | | | |
| Arizona | Nov. | 110.7 | 0.5 | -0.4 | NA | NA |
| BUILDING PERMITS (Total Dollar Value in Thousands) | | | | | | |
| Maricopa County | Oct. | 253,726 | 9 | -28 | 2,943,111 | -14 |
| Pima County | Oct. | 28,892 | 5 | -27 | 393,017 | -22 |
| Balance of State | Oct. | 46,059 | -15 | -31 | 580,368 | 0 |
| Arizona | Oct. | 328,677 | 4 | -28 | 3,916,496 | -13 |
| TOTAL HOUSING UNITS AUTHORIZED | | | | | | |
| Maricopa County | Oct. | 1,561 | 11 | -36 | 19,105 | -23 |
| Pima County | Oct. | 352 | -11 | -2 | 4,636 | -18 |
| Balance of State | Oct. | 708 | -2 | -32 | 8,129 | -11 |
| Arizona | Oct. | 2,621 | 4 | -32 | 31,870 | -20 |
| HOME SALES | | | | | | |
| Maricopa County - Number | Nov. | 3,240 | -34 | -29 | 47,110 | -15 |
| Maricopa County - Median Price | Nov. | 82,000 | 1.2 | -0.2 | 80,375 | 0.5 |
| HOUSING AFFORDABILITY INDEXES | | | | | | |
| Metropolitan Phoenix - New Homes | 3rd Qtr. | 92 | -2.1 | 2.2 | NA | NA |
| Metropolitan Phoenix - Resale Homes | 3rd Qtr. | 119 | -1.7 | 5.3 | NA | NA |
| MORTGAGE INTEREST RATES (Conventional, 30-year, Fixed-rate) | | | | | | |
| Maricopa County | Dec. | 10.6 | 3.9 | 0.0 | NA | NA |
| POPULATION ESTIMATES (In Thousands) | | | | | | |
| Maricopa County | 3rd Qtr. | 2,025 | 0.5 | 2.1 | NA | NA |
| Arizona | 3rd Qtr. | 3,507 | 0.4 | 2.0 | NA | NA |
| ELECTRICAL POWER SALES (In Millions of Kilowatt Hours) | | | | | | |
| Arizona | Oct. | 3,597 | -8.0 | 19.8 | 37,191 | 13.5 |

NA = Not Applicable

*Source:* Center for Business Research, College of Business, Arizona State University.

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